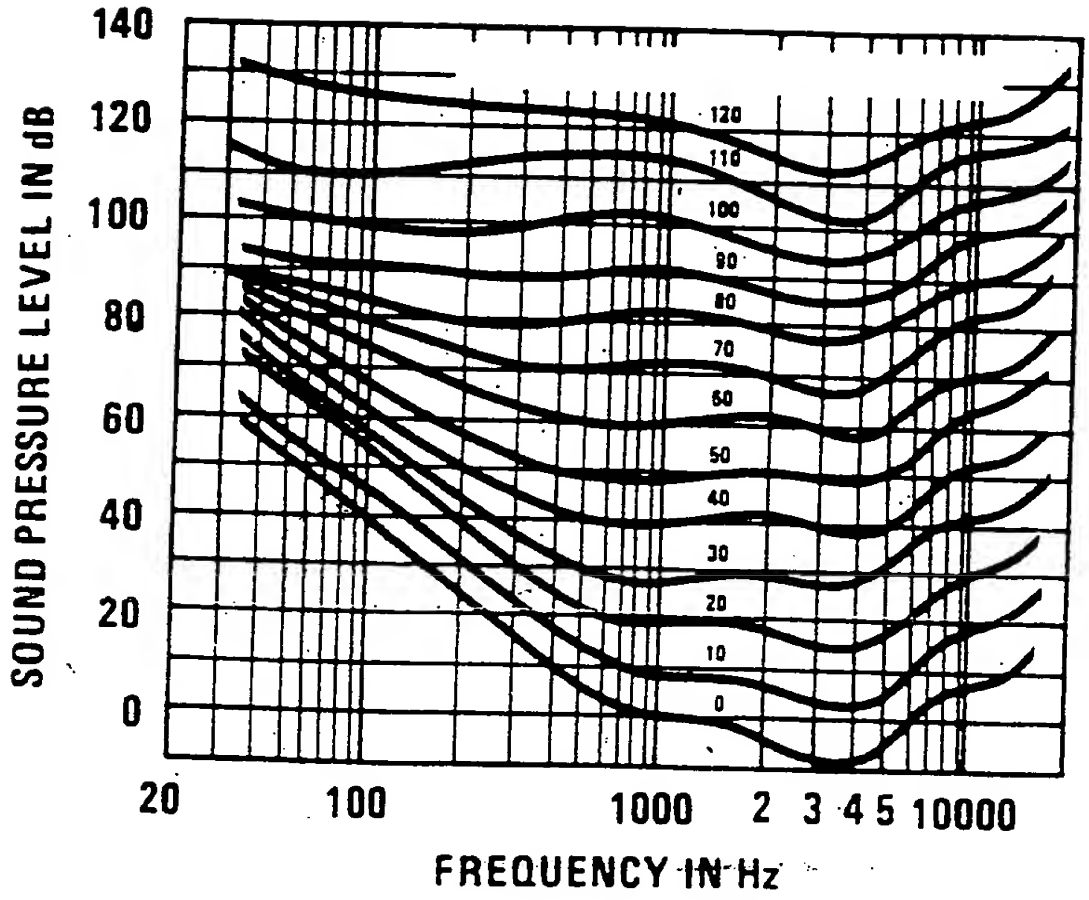
0080800-0L08595D



Fletcher-Munson Curves

FIG. 1

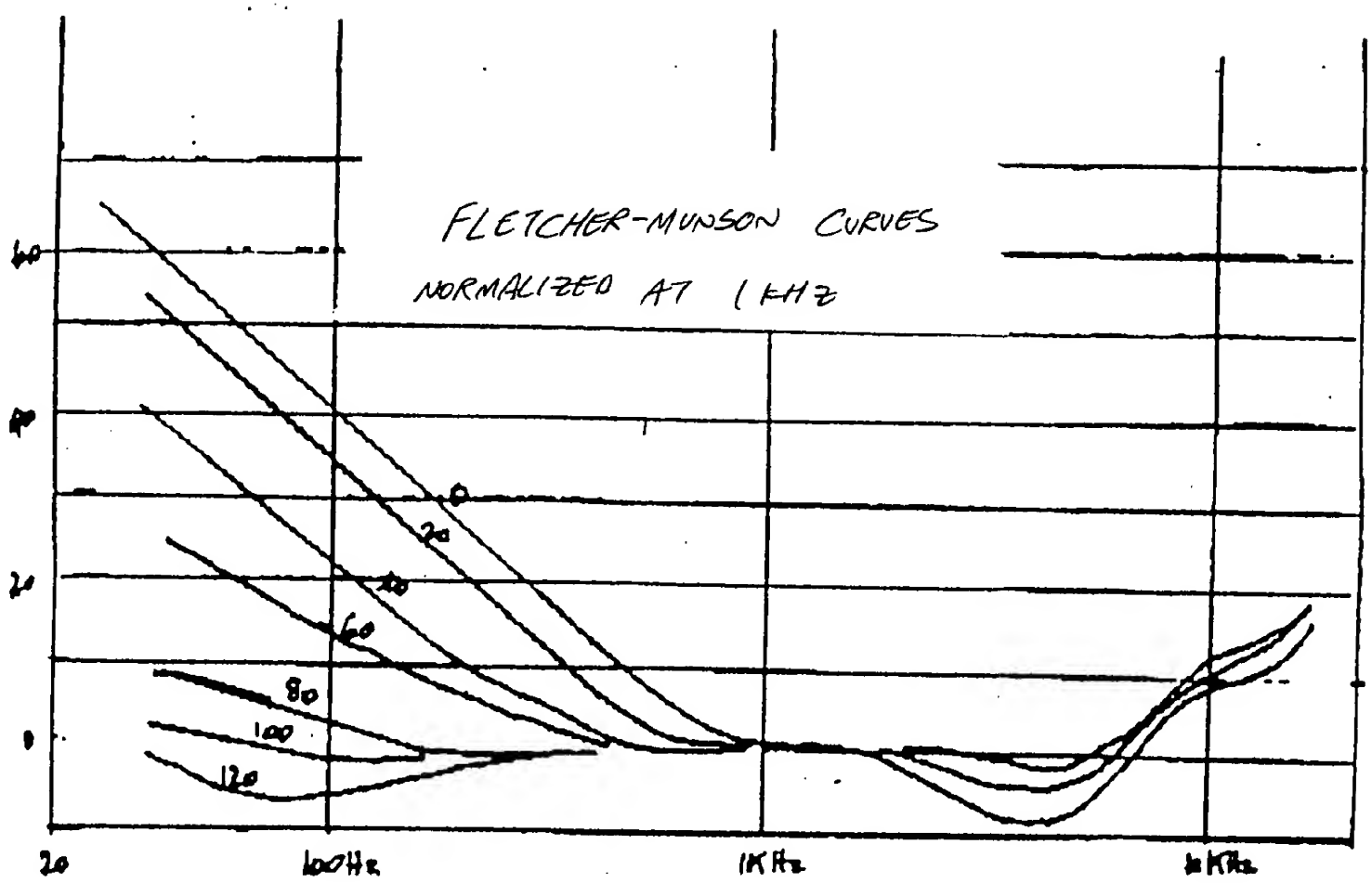

FLETCHER-MUNSON CURVES
NORMALIZED AT 1 KHz
0
20
40
60
80
100
120
20
100Hz
1K Hz
10K Hz

FIG. 2

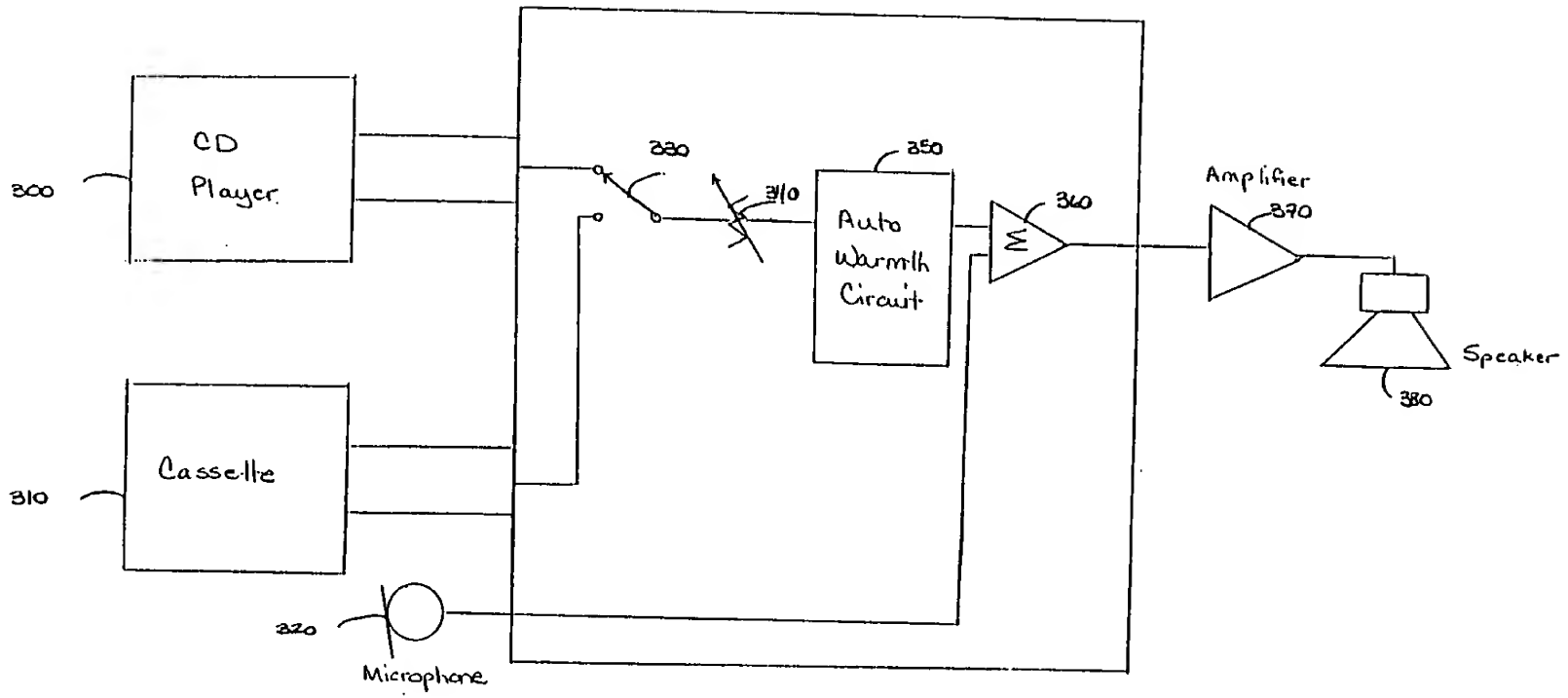

CD
Player
300
Cassette
310
320
Microphone
330
310
350
Auto
Warmth
Circuit
360
Amplifier
370
Speaker
380

FIG. 3

FIG. 4

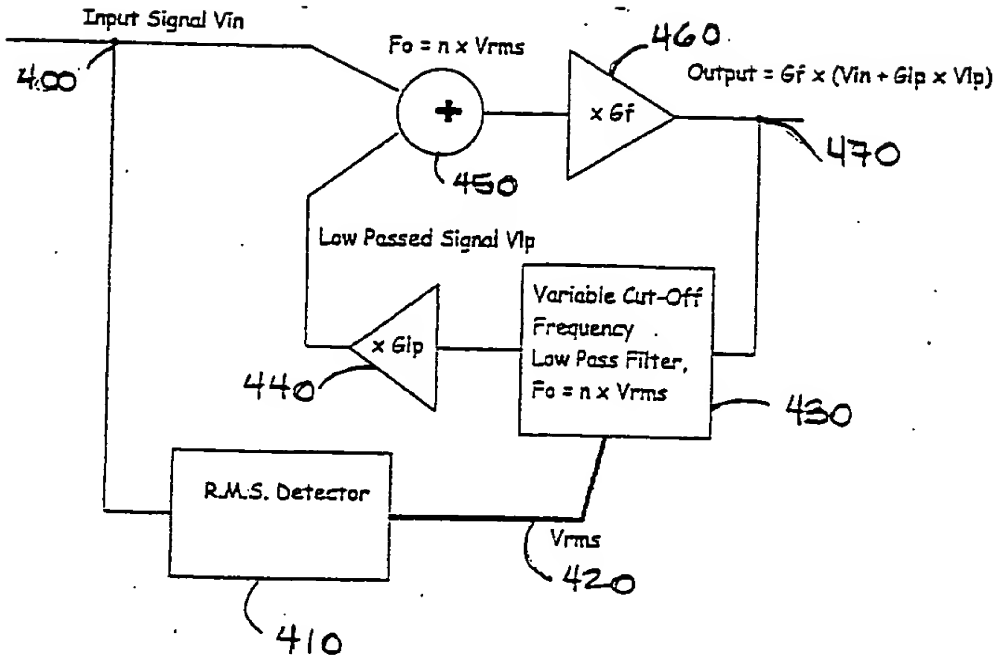

Input Signal Vin
400
Fo = n x Vrms
460
Output = Gf x (Vin + Gip x Vlp)
x Gf
470
450
Low Passed Signal Vlp
Variable Cut-Off Frequency Low Pass Filter, Fo = n x Vrms
x Gip
440
430
R.M.S. Detector
Vrms
420
410

FIG. 5A

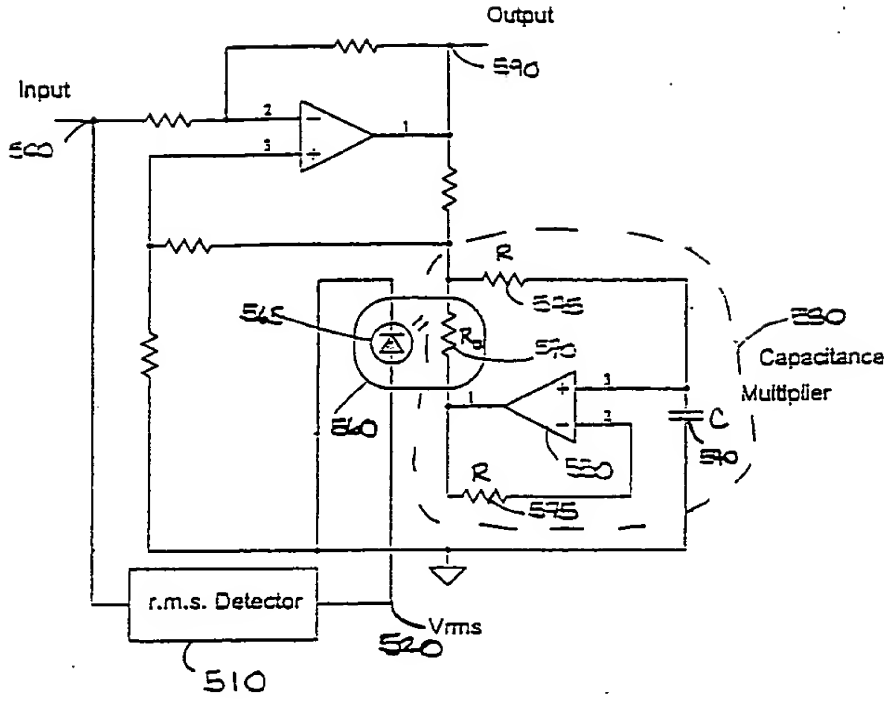
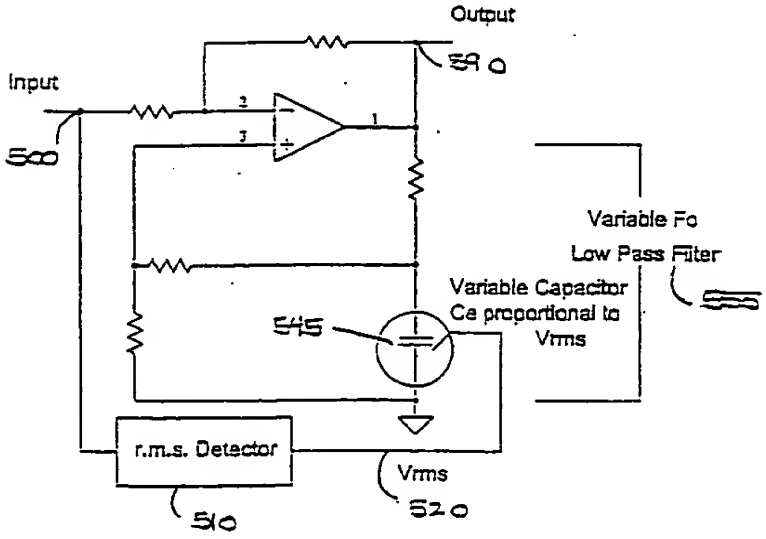


FIG. 5B



0080060 "0708960

0080601 "0102560

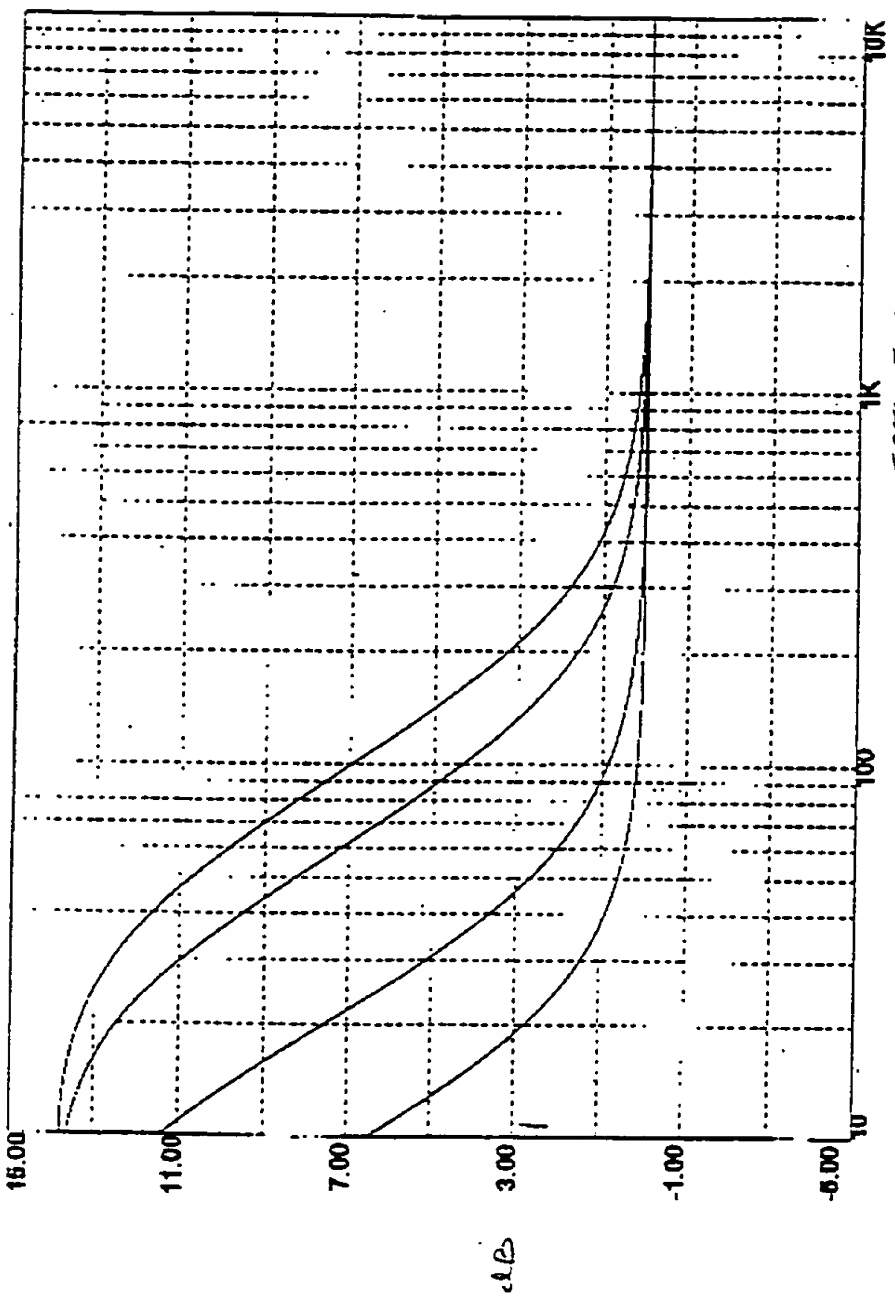


FIG. 6

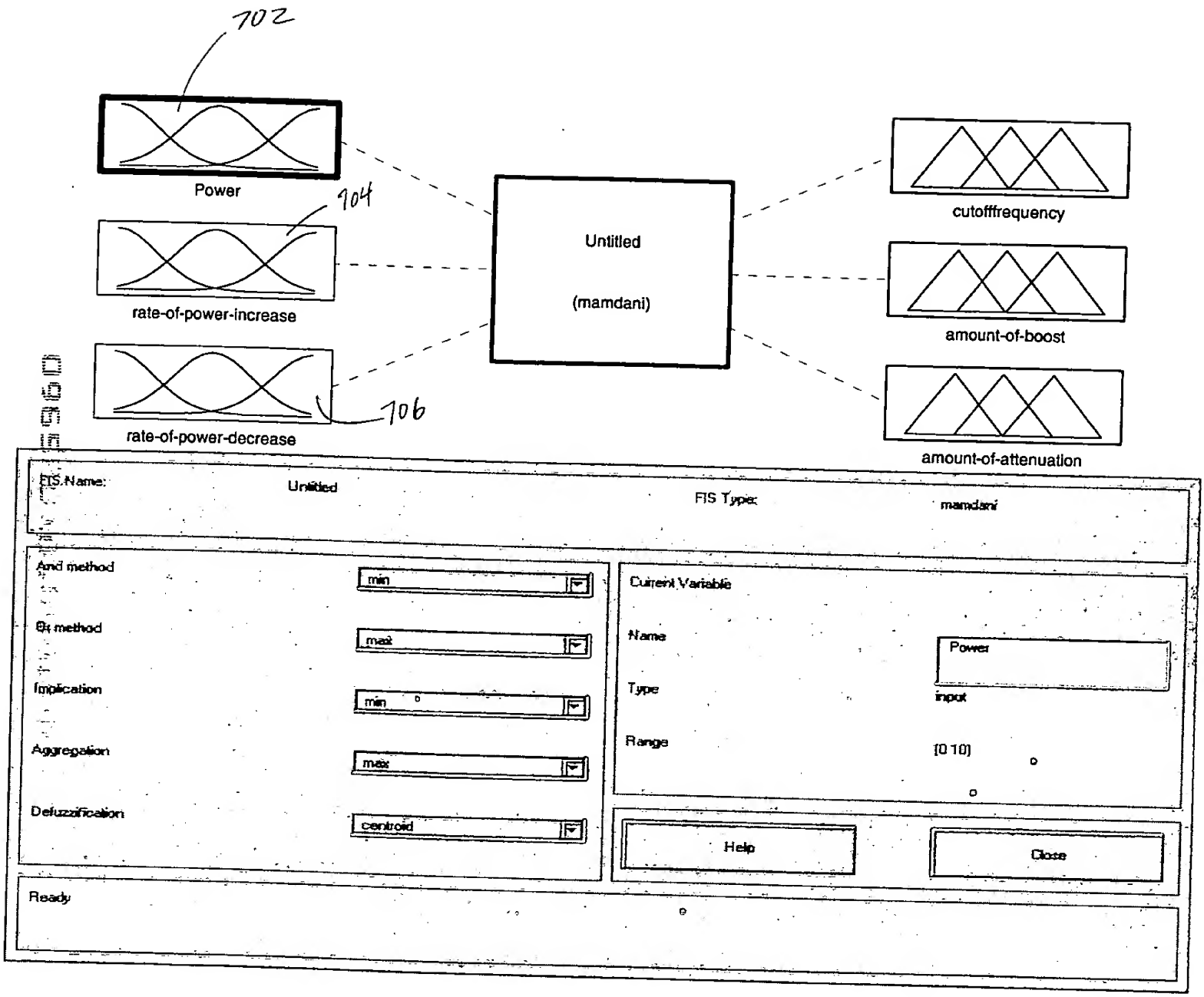

702
Power
704
rate-of-power-increase
706
rate-of-power-decrease
Untitled
(mamdani)
cutofffrequency
amount-of-boost
amount-of-attenuation
FIS Name:
Untitled
FIS Type:
mamdani
And method
min
Or method
max
Implication
min
Aggregation
max
Defuzzification
centroid
Current Variable
Name
Power
Type
input
Range
[0 10]
Help
Close
Ready

FIG. 7A

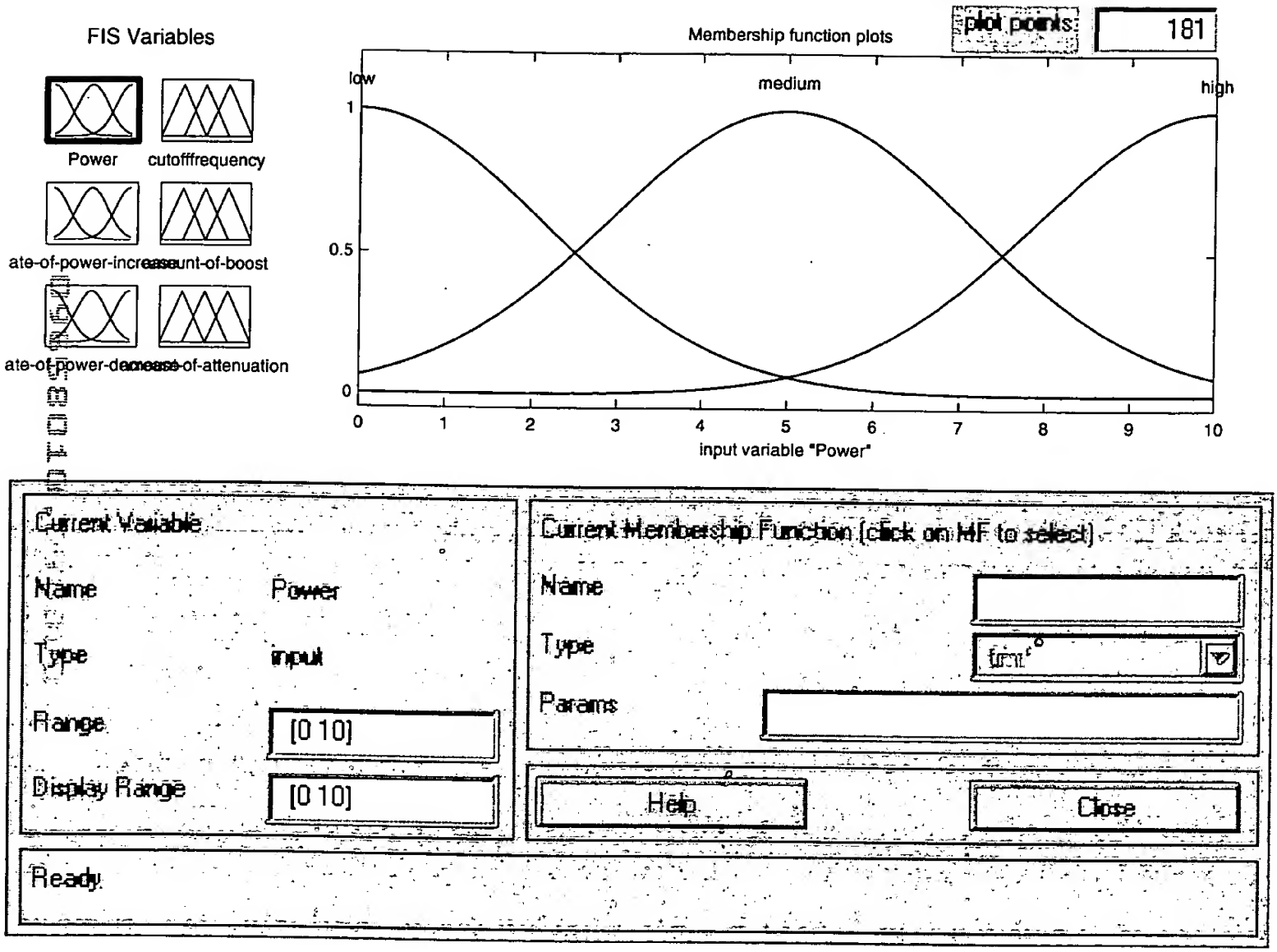

FIS Variables
Power
cutofffrequency
ate-of-power-increase
unt-of-boost
ate-of-power-decrease
-of-attenuation
Membership function plots
plot points:
181
low
medium
high
1
0.5
0
0
1
2
3
4
5
6
7
8
9
10
input variable "Power"
Current Variable
Name
Power
Type
input
Range
[0 10]
Display Range
[0 10]
Current Membership Function (click on MF to select)
Name
Type
Params
Help
Close
Ready

FIG. 7B

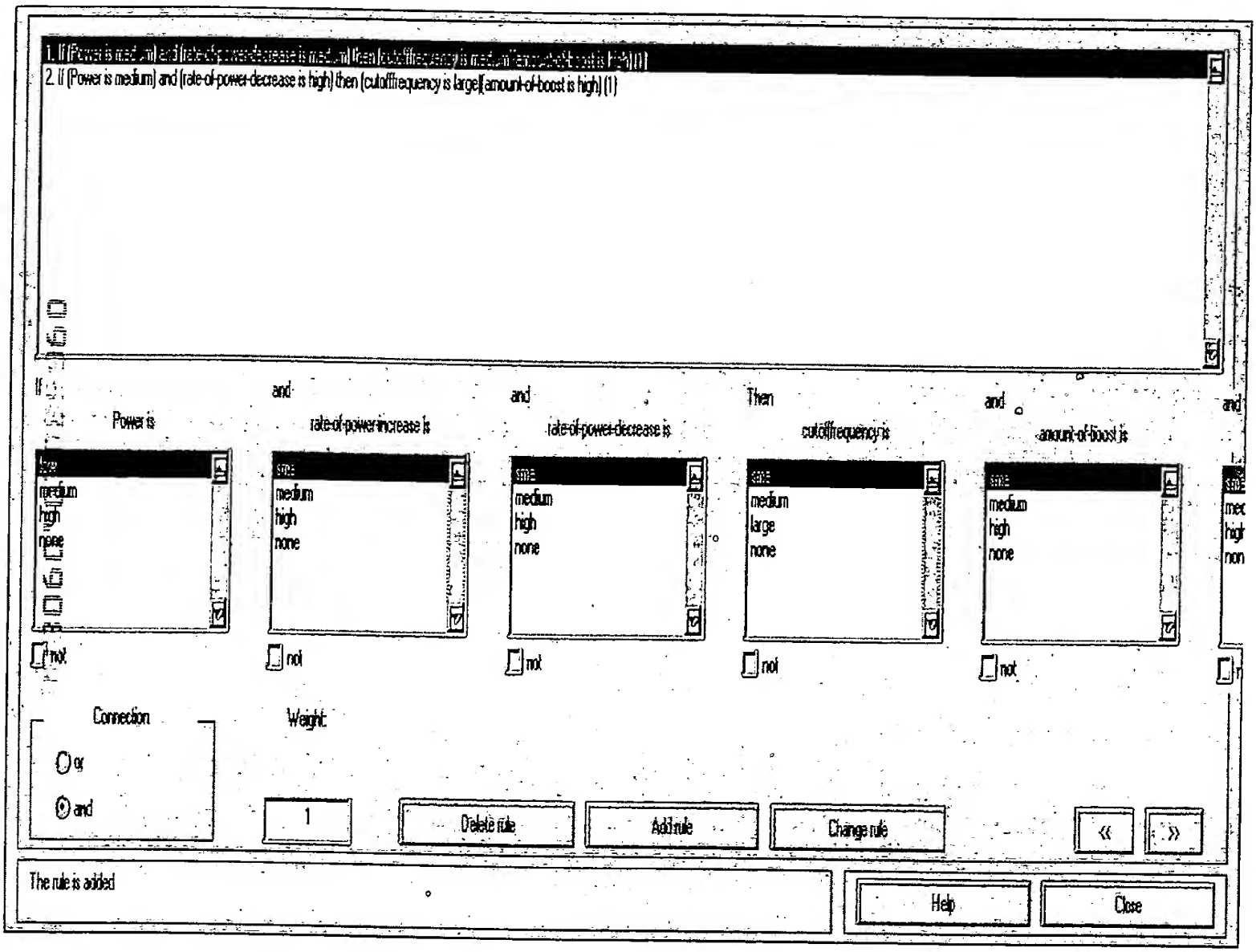

2. If (Power is medium) and (rate-of-power-decrease is high) then (cutoffrequency is large)(amount-of-boost is high) (1)
If
Power is
and
rate-of-power-increase is
and
rate-of-power-decrease is
Then
cutoffrequency is
and
amount-of-boost is
and
low
medium
high
none
small
medium
high
none
small
medium
high
none
small
medium
large
none
small
medium
high
none
not
not
not
not
not
Connection
or
and
Weight
1
Delete rule
Add rule
Change rule
«
»
The rule is added
Help
Close

FIG. 7C

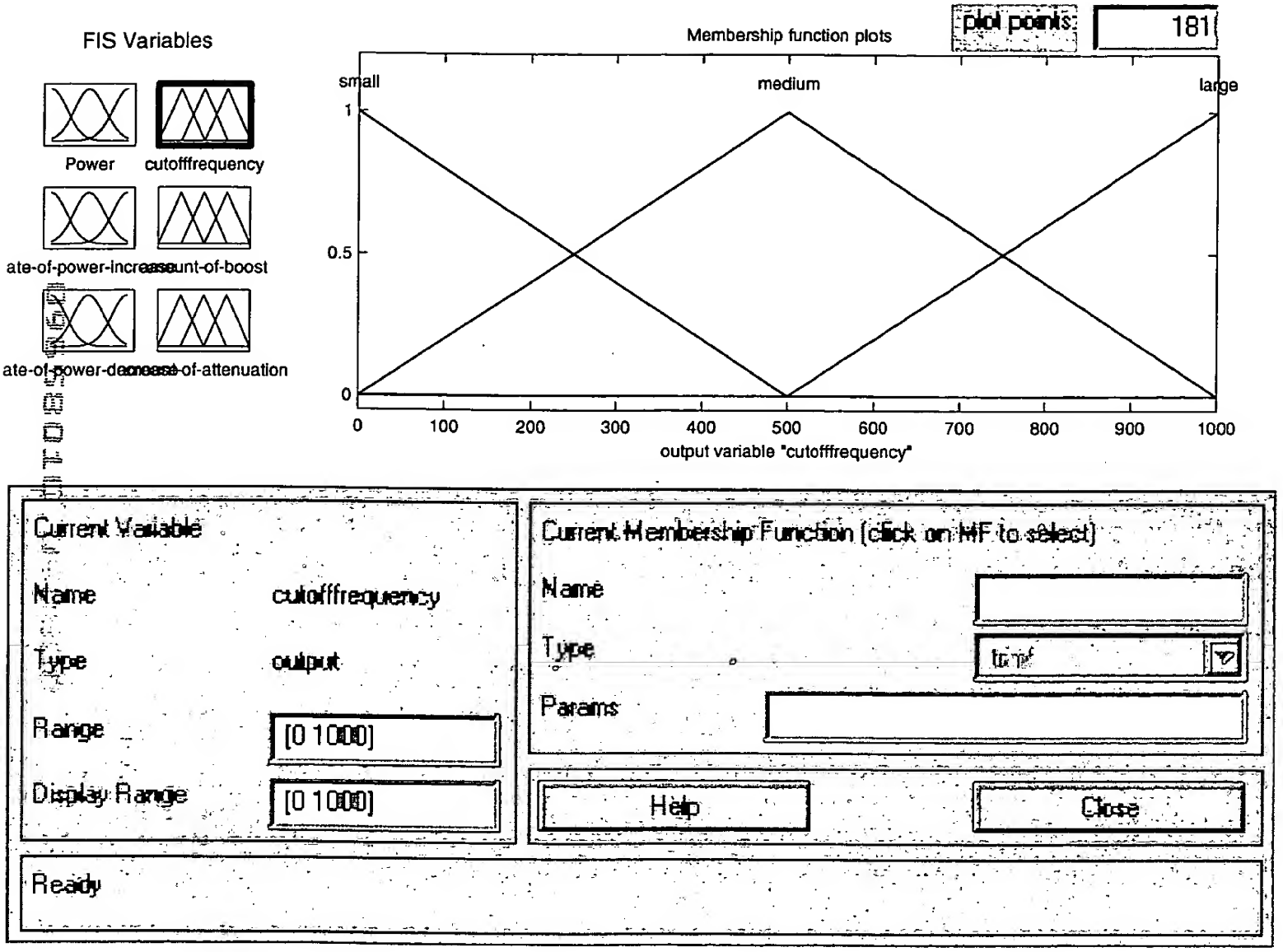

FIS Variables
Power
cutofffrequency
ate-of-power-increase
unt-of-boost
ate-of-power-decrease
-of-attenuation
Membership function plots
Plot points:
181
small
medium
large
1
0.5
0
0
100
200
300
400
500
600
700
800
900
1000
output variable "cutofffrequency"
Current Variable
Name
cutofffrequency
Type
output
Range
[0 1000]
Display Range
[0 1000]
Current Membership Function (click on MF to select)
Name
Type
Params
Help
Close
Ready

FIG. 7D

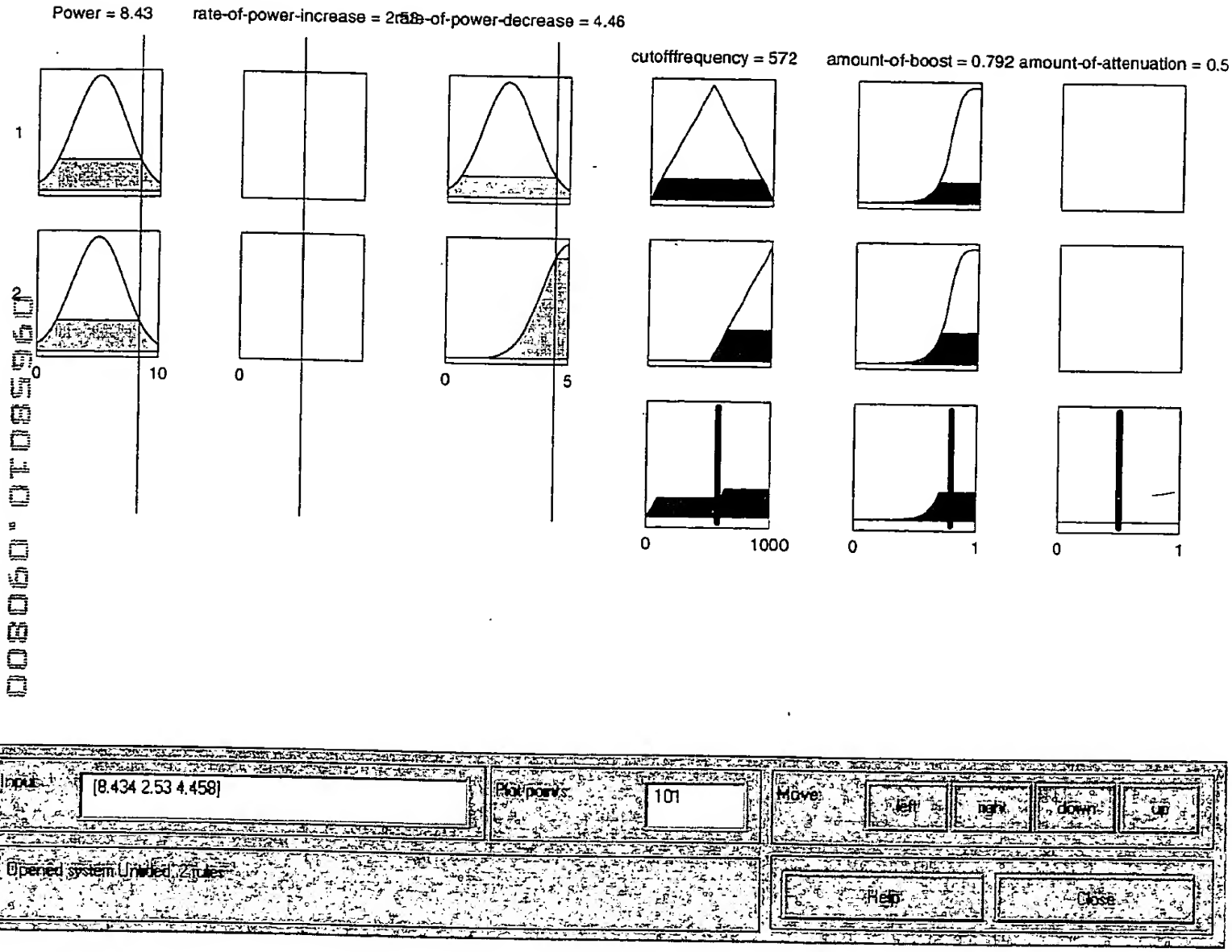

Power = 8.43
rate-of-power-increase = 2.53
rate-of-power-decrease = 4.46
cutofffrequency = 572
amount-of-boost = 0.792
amount-of-attenuation = 0.5
1
2
0
10
0
0
5
0
1000
0
1
0
1
Input:
[8.434 2.53 4.458]
Plot pars:
101
Move:
left
right
down
up
Opened system Untitled, 2 rules
Help
Close

FIG. 7E